



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/776,675	02/06/2001	Nobuo Ishii	08038.0048	2524

22852 7590 10/03/2002

FINNEGAN, HENDERSON, FARABOW, GARRETT &
DUNNER LLP
1300 I STREET, NW
WASHINGTON, DC 20006

EXAMINER

CROWELL, ANNA M

ART UNIT	PAPER NUMBER
----------	--------------

1763

DATE MAILED: 10/03/2002

6

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/776,675

Applicant(s)

ISHII, NOBUO

Examiner

Michelle Crowell

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 July 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-8 and 10-20 is/are rejected.
- 7) ☒ Claim(s) 2 and 9 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 30 July 2002 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The proposed drawing correction and/or the proposed substitute sheets of drawings, filed on July 30 have been approved. A proper drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The correction to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-14 and 17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1, 8 and 17 are indefinite because they use the term "rectangular waveguide". Is the shape of the ring-shaped antenna waveguides rectangular? Is the cross-sectional area of the antenna rectangular in shape? Is the shape of the connecting waveguide rectangular? The term "rectangular waveguide" is unclear.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are

Art Unit: 1763

such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1, 3-8, 10-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsumoto (Japanese Patent Publication 11-121196) in view of Suzuki et al. (EP 0880164) and Imahashi et al. (U.S. 5,432,472).

Note. U.S. Patent 6,076,484 is used as the English translation for Japanese Patent Publication 11-121196. The numbers in parentheses refer to the U.S. equivalent.

Referring to Figures 4(3) and 5(9), column (8), lines (36-65) and column (10), line (47) – column (11), line (5)), Matsumoto discloses a microwave plasma process apparatus designed to improve process speed and distribute plasma uniformly. The microwave apparatus comprises a reactor 1 (process vessel), antenna 11 for introducing microwaves into the reactor 1, microwave introducing window which is sealed to sealing plate 4 (microwave transmittable top wall), microwave oscillator 20 (microwave source), waveguide 21 (connecting waveguide) for connecting the waveguide antenna part 12 (ring-shaped antenna waveguide) to the microwave oscillator 20, and plural slits 15 (plurality of slots) disposed in the wall of waveguide antenna part 12.

As seen in Figure 5(9), the proximal end portion (side aperture) of the waveguide antenna part 12 is coupled with waveguide 21 and forms the curve portion 12a (substantially radial direction). In addition, the terminal end portion of the waveguide antenna part 12 is closed with a conductive movable plate 17 (conductor). The moveable plate 17 reflects the microwaves, thereby producing a standing wave.

Matsumoto fails to teach a plurality of substantially ring-shaped antenna waveguides and a microwave absorber.

Art Unit: 1763

Referring to Figures 19a-c, column 27, lines 30-56, Suzuki teaches that it is known for a microwave applicator 3 (antenna) to have a plurality of annular waveguides 43 and 44 (ring shaped antenna waveguides). Furthermore, microwaves are introduced to each annular waveguide 43 and 44 from the respective microwave introducing ports 54 and 55 (plurality of apertures). Also, each annular waveguide 43 and 44 contains a plurality of slots 3b and 3b'. A plurality of ring-shaped antenna waveguides provide uniform microwave radiation intensity distribution. It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the apparatus of Matsumoto with a plurality of ring-shaped antenna waveguides with apertures as taught by Suzuki. This would allow microwaves to radiate over a large area and for uniform microwave radiation intensity distribution.

Referring to Figures 1 and 4, and column 4, lines 37-42, Imahashi teaches a microwave absorbing body 41 (microwave absorber) for absorbing reflected waves generated in the waveguide 4 (connecting waveguide). The microwave absorbing body 41 is located in the terminal end of the waveguide 4. In addition, the microwave absorbing body 41 prevents the return of the reflected waves to the magnetron. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the connecting waveguide and antenna waveguides of Matsumoto with a microwave absorber as taught by Imahashi.

Allowable Subject Matter

6. Claims 2 and 9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Response to Arguments

8. Applicant's arguments filed July 30, 2002 have been fully considered but they are not persuasive.

9. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

In this case, Matsumoto teaches an antenna waveguide with a proximal end portion, a terminal end portion, and a connecting waveguide connected to the proximal end portion of the antenna waveguide. Suzuki teaches using a plurality of ring-shaped antenna waveguides to provide uniform microwave radiation intensity distribution. Therefore, the motivation is to have a plurality of antenna waveguides with each antenna waveguide having a proximal end portion, a terminal end portion, and a connecting waveguide connected to the proximal end portion of the antenna waveguides is to **provide uniform microwave radiation intensity distribution**.

Art Unit: 1763

10. In response to applicant's argument that the problem addressed by Suzuki is different than the problem addressed by Matsumoto does not alter the motivation to combine the two references since the references are analogous. Both references have the same field of endeavor which is microwave plasma processing systems.

11. In response to applicant's argument that the combination does not show a reasonable expectation of success, because it is unclear as to how the plurality of annular waveguides of Suzuki could be incorporated into the device of Matsumoto with respect to the connecting waveguide. The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michelle Crowell whose telephone number is (703) 305-1956. The examiner can normally be reached on M-F (8:00 - 4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on (703) 308-1633. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.


Application/Control Number: 09/776,675

Page 7

Art Unit: 1763

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

AMC *ame*
October 1, 2002


GREGORY MILLS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700